

REMARKS

The Official Action of May 3, 2006, and the prior art relied upon therein have been carefully reviewed. The claims in the application are now claims 1-11, and these claims define patentable subject matter warranting their allowance. The applicants respectfully request favorable reconsideration and allowance.

Acknowledgement by the PTO of the receipt of applicants' papers filed under §119 is noted.

Claims 3 and 4 have been rejected under the first paragraph of §112 as not being enabling. The rejection states that it is not clear to the examiner how the fuel cell would remain in operation when blowers are arranged in opposition to both open ends of the oxygen grooves on the oxygen passage plates of the cell stack. The rejection is respectfully traversed.

The fuel cell as defined in the pending claim 3 with reference to Figures of the present application is described as follows.

The air (including oxygen) fed to an outer periphery of an oxygen flow passage plate by the blowers (e.g. 62, 66) is forcibly supplied to an oxygen electrode (e.g. 13b) from the outer periphery of the oxygen flow passage plate (e.g. 18) and then through internal portions thereof to the surface of the

oxygen electrodes to react with the fuel at a polymer electrolyte membrane (e.g. 12). The air is supplied from both open end portions of grooves (e.g. 182) provided in the oxygen flow passage plates (e.g. 18) and forced toward the central portion of the oxygen flow passage plate 18 by the force of the blowers. Thus, the fuel cell as defined in claim 4 can further improve the performance of the power generation because the air (including oxygen) can be supplied more effectively. (These matters are referred to page 4, line 22, to page 5 line 7; page 5, line 25, to page 6, line 9; page 6, line 18, to page 7, line 4; page 10, line 27, to page 11, line 13; page 12, line 24, to page 13, line 12; and page 13 line 24, to page 24, line 3, of the English text.)

Then, the fuel is supplied through a fuel flow passage (e.g. 44), a fuel distribution manifold (e.g. 32) to a fuel electrode (e.g. 13a) so as to arrive at the solid polymer electrolyte membrane (e.g. 12) and this should be clear to those skilled in the art (see page 13, lines 2-3, of the English text and Fig. 9 etc.) Further, a connection of a power source of the blowers may be made directly to the fuel cell itself or other than the fuel cell. (This matter is referred to page 17, lines 6-8, of the English text.)

Withdrawal of the rejection is in order and is respectfully requested.

New claims 6-11 have been added. Applicants believe that support is absolutely clear and need not be pointed out in detail. These claims are patentable for the same reasons as the other claims, as pointed out in detail below.

Claim 1 has been rejected as obvious under §103 from Kenyon et al USP 6,423,437 (Kenyon) in view of Lee et al U.S. published application 2003/0219635 (Lee). This rejection is respectfully traversed.

Kenyon is somewhat similar to the acknowledged prior art, and in a sense can be considered to be a starting point for the present invention. As recognized by the examiner, Kenyon does not disclose or make obvious one of the key features of the present invention, namely an oxygen passage plate having the characteristics of applicants' embodiment as shown in Figs. 1 and 2. For this feature, the rejection relies on Lee, and the PTO concludes that it would have been obvious in view of Lee to incorporate grooves in the faces of the plates of Kenyon and thus reach applicants' invention as called for in claim 1. Respectfully, applicants do not agree.

Lee discloses a system which is basically and fundamentally different from that of both the present invention and Kenyon. The key aspect of the Lee disclosure is a provision of a coolant flow passage to cool the fuel cell stack. To do this, a plate is provided having a first side defining a reactant flow field and a second side defining a coolant flow field,

noting paragraph [0007]. Such a system does not, and indeed cannot, reasonably have a porous oxygen passage plate.

Indeed Lee discloses all plates as being non-porous, i.e. plates which do not pass gas therethrough, in which flow passages are provided (see paragraph [0016] and Fig. 1). Lee does not show, suggest or teach that grooves are provided in the oxygen flow passage plate through which gas can pass. Further, the flow passages as clearly shown in Fig. 1 of Lee have no outwardly open structure as claimed, so air cannot pass to such passages from the outside.

Therefore, even if the flow passages of Lee were to be obviously incorporated into Kenyon, and applicant maintains that such a combination would not have been obvious, the performance of power generation could not be improved since air cannot flow directly thereinto from the outside.

Applicants further respectfully submit that even if the references could possibly be combined in retrospect, it would nevertheless not have been obvious to combine them as proposed at the time the present invention was made, primarily because of the fundamental differences between Lee and Kenyon as pointed out above. No reason or purpose, teaching or suggestion, motive or incentive exists to take grooves from Lee and incorporate them into Kenyon for an entirely different purpose not suggested by either Lee or Kenyon.

Applicants respectfully submit that it would not have been obvious to combine a member from a fuel cell of the active type as disclosed in Lee with a fuel cell of a passive type as per Kenyon, having a structure fundamentally different from that of Lee.

One additional point should be addressed, and that is the disclosure in Lee of flow channels in paragraph [0004], referred to in the Office Action. These flow channels are described in the "Background" section of Lee, and are thus denigrated at least to some extent, i.e. Lee suggests that such systems are inadequate and that the very different system urged as an invention in Lee is superior. Applicants submit that in effect Lee teaches away from adopting an array of grooves as in the prior art existing before Lee.

Regardless, the grooves described by Lee in paragraph [0004] are of a different character than those of the present invention, i.e. these are the flow passages in which gas flows in at one end (a supplying functional portion) to another end thereof (discharging functional portion), i.e. "the gaseous reactants flow from a supply header at one end of the flow channels to an exhaust header at the opposite end of the flow channels." There is not the remotest suggestion of providing grooves in a porous oxygen passage plate to improve the distribution of air through the porous oxygen passage plate to the adjacent oxygen electrode.

Withdrawal of the rejection is in order and is respectfully requested.

Claim 2 has been rejected under §103 as obvious from Kenyon in view of Lee and further in view of Reiser USP 6,497,971. Claim 5 is not included in the statement of the rejection, but from page 6 of the Office Action it appears as though claim 5 may have been intended to be included. Either way, the rejection is respectfully traversed.

Claims 2 and 5 depend from and incorporate the subject matter of claim 1. Reiser has not been cited to make up for the deficiencies of the proposed combination of Kenyon in view of Lee as discussed above, and indeed does not do so. Therefore, even if the proposed combination of Reiser and Kenyon were obvious, it would not reach the subject matter of claims 2 and/or 5.

Withdrawal of the rejection is in order and is respectfully requested.

Claims 3 and 4, while rejected under the first paragraph of §112, have not been rejected on the basis of any prior art. Accordingly, applicants understand that the PTO considers that claims 3 and 4 are not made obvious by any prior art i.e. they define novel and unobvious subject matter under §§102 and 103.

The prior art documents of record and not relied upon by the PTO have been noted, along with the implication that such

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documents are deemed by the PTO to be insufficiently material to warrant their application against any of applicants' claims.

Applicants believe that all issues raised in the Office Action have been addressed above in a manner favorable to allowance of the present application. Accordingly, applicants respectfully request favorable reconsideration and early formal allowance.

Respectfully submitted,

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